Mr. John Sullivan
Alternative Recycling LLC
804 Wabash Avenue
Chesterton, Indiana, 46304

Dear Mr. Sullivan

> Re: Exempt Construction and Operation Status,
>   091-12221-00122

The application from Alternative Recycling LLC, received on May 1, 2000, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following pilot facility for the recycling of revert materials from steel mills and minimills, to be located at 402 Truesdall Avenue, LaPorte, Indiana, is classified as exempt from air pollution permit requirements:

(a)   One (1) mixer with a maximum capacity limited by the agglomeration operation

(b)   One (1) agglomeration machine, with a maximum capacity of eighteen (18) tons per hour.

(c)   One (1) feed hopper

(d)   Two (2) storage silos equipped with dust control equipment (cartridge type filter)

(e)   One (1) covered conveyor

The following conditions shall be applicable:

(1)   Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:

(a)   Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b)   Opacity shall not exceed sixty percent (60%) for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuos opacity monitor in a six (6) hour period.

(2)   Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations) the particulate matter (PM) from the proposed facility shall be limited by the following:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 \, P^{0.67}$$ where E = rate of emission in pounds per hour and

P = process weight rate in tons per hour

This exemption is the first air approval issued to this source.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Management (OAM) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Management

DWH

cc: File - LaPorte County
        LaPorte County Health Department
        Air Compliance – Rick Massoels
        NWRO
        Permit Tracking - Janet Mobley
        Technical Support and Modeling - Michele Boner
        Compliance Data Section - Karen Nowak

Indiana Department of Environmental Management
Office of Air Management

Technical Support Document (TSD) for an Exemption

Source Background and Description

Source Name:	Alternative Recycling LLC
Source Location:	402 Truesdall Avenue, LaPorte, Indiana
County:	LaPorte
SIC Code:	3297
Operation Permit No.:	091-12221-00122
Permit Reviewer:	David Howard

The Office of Air Management (OAM) has reviewed an application from Alternative Recycling LLC relating to the construction and operation a pilot facility for recycling revert materials from steel mills and minimills as its raw material. The revert materials consist of mechanically dewatered basic oxygen process sludge, mechanically dewatered blast furnace filter cake, mill scales from hot forming facilities and electric arc furnace baghouse dust. The source's facility consists of the following units:

(a)   One (1) mixer

(b)   One (1) agglomeration machine, with a maximum capacity of eighteen (18) tons per hour.

(c)   One (1) feed hopper

(d)   Two (2) storage silos equipped with dust control equipment (cartridge type filter)

(e)   One (1) covered conveyor

The agglomeration machine uses mechanical pressure to form the blended mix of the binding agent and revert material into bricks. The agglomeration machine has a maximum capacity of eighteen (18) tons per hour, therefore the entire process is limited to eighteen (18) tons per hour.

Stack Summary

There are no stacks currently at the facility that emit to the atmosphere.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on May 1, 2000.

Emission Calculations

The calculations submitted by the applicant have been verified and found to be accurate and correct. These calculations are provided in Appendix A of this document (four (4) pages).

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency."

Pollutant	Potential To Emit (tons/year)
PM	3.67
PM-10	.73
SO_2	0
VOC	0
CO	0
NO_x	0

HAP's	Potential To Emit (tons/year)
Arsenic	.000367
Cadmium	.000367
Chromium	.00110
Lead	.000367
Manganese	.00807
Nickel	.000367
Total	.0106

The proposed facility will only emit particulate matter (PM) because the operation is a cold process. No heating will be required to produce the desired mechanical and chemical properties. The hazardous air pollutants (HAPs) are found in trace quantities of the revert materials to be recycled, and are emitted as particulate matter (PM).

County Attainment Status

The source is located in LaPorte County.

Pollutant	Status
PM-10	Attainment
SO_2	Attainment
NO_2	Attainment
Ozone	Attainment
CO	Attainment
Lead	Attainment

Source Status

New Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	3.67
PM10	.73
SO_2	0
VOC	0
CO	0
NO_x	0
Single HAP	.00807
Combination HAPs	.0106

(a)   This new source is not a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

(b)   The potential to emit, as defined in 326 IAC 2-1.1-1(16), of particulate matter (PM) is less than five (5) tons per year. Therefore pursuant to 326 IAC 2-5.1-1 the source will be issued an exemption.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)
This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:
(a)   Each criteria pollutant is less than 100 tons per year,
(b)   A single hazardous air pollutant (HAP) is less than 10 tons per year, and
(c)   Any combination of HAPs is less than 25 tons/year.

This is the first air approval issued to this source.

Federal Rule Applicability

(a)   There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.

(b)   There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a)   Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b)   Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-3-2 (Particulate Emission Limitations)

The particulate matter (PM) from the proposed facility shall be limited by the following:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 \, P^{0.67}$$ where E = rate of emission in pounds per hour and
                              P = process weight rate in tons per hour

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 188 hazardous air pollutants (HAPs) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

(a)   This source will emit levels of air toxics less than those that constitute a major source according to Section 112 of the 1990 Clean Air Act Amendments.

(b)   See attached calculations for detailed air toxic calculations

Conclusion

The construction and operation of this pilot facility for recycling revert materials from steel mills and minimills as its raw material shall be subject to the conditions of the attached proposed Exemption Permit 091-12221-00122.

Appendix A – Calculations

Calculation of the Emissions of Particulate Matter to the Building Interior

Predictive equation for AP-42 for Aggregate Handling Emissions:

$$E = k * 0.0032 \left[\frac{\left(\dfrac{U}{5} \right)^{1.3}}{\left(\dfrac{M}{2} \right)^{1.4}} \right]$$

where: E = Particulate matter emission factor per drop in pounds per ton

U = Wind speed in miles per hour

M = Moisture content in percent weight per weight

k = Particulate size multiplier

k = 0.74 for PM

k = 0.36 for PM_{10}

Calculate Emission Factors per Drop

$$E_{PM} = 0.74 * 0.0032 \left[\frac{\left(\dfrac{2.273}{5} \right)^{1.3}}{\left(\dfrac{10}{2} \right)^{1.4}} \right] = 0.00008928 \text{ lbs PM/drop} - \text{ton}$$

$$E_{PM\,10} = 0.36 * 0.0032 \left[\frac{\left(\dfrac{2.273}{5} \right)^{1.3}}{\left(\dfrac{10}{2} \right)^{1.4}} \right] = 0.00004343 \text{ lbs } PM_{10}/\text{drop} - \text{ton}$$

Emissions form Material Receipt, Pre-blending into Mixer

PM: $7 \text{ drops} * \dfrac{0.00008928 \text{ lbs PM}}{\text{drop - ton}} * \dfrac{18 \text{ tons}}{\text{hr}} = 0.01125 \text{ lbs PM/hr}$

PM_{10}: $7 \text{ drops} * \dfrac{0.00004343 \text{ lbs PM}}{\text{drop - ton}} * \dfrac{18 \text{ tons}}{\text{hr}} = 0.00547 \text{ lbs } PM_{10}/\text{hr}$

Emissions from Mixer

PM: $\dfrac{0.04 \text{ lbs PM}}{\text{ton}}(1-0.99)*\dfrac{18 \text{ tons}}{\text{hr}} = 0.0072$ lbs PM/hr

PM$_{10}$: $\dfrac{0.02 \text{ lbs PM}}{\text{ton}}(1-0.99)*\dfrac{18 \text{ tons}}{\text{hr}} = 0.0036$ lbs PM$_{10}$/hr

Assumes a 99% enclosure efficiency

Calculation of Emissions from Front End Loader Travel

$$E = k\left(\frac{sL}{2}\right)^{0.65} * \left(\frac{W}{3}\right)^{1.5}$$

where:

E = Emission factor in grams per vehicle kilometer traveled

(sL) = Silt loading in grams per square meter of road surface

W = Average vehicle weight in metric tons

k = Particle size multiplier

k = 24 for PM

k = 4.6 for PM$_{10}$

Silt Loading

Total dust loading (L) is ½ of that specified in AP-42 for steel mill roads

L = 0.50 * 1,730 = 865 lbs dust/mile road

s = 0.03

(sL) = 0.03 * 865 = 25.95 lbs silt/mile or 0.799 grams silt/M

Calculate Maximum Theoretical Vehicle Miles Traveled

$1 \text{ loader} * \dfrac{2 \text{ miles}}{\text{hr}} = \dfrac{2 \text{ loader miles}}{\text{hr}} = 2$ vehicle miles traveled per hour

Calculate Average Weight per Loader

Unloaded Weight = 13 tons

Bucket Weight = 2 tons

Loaded Weight = 15 tons

Mean Vehicle Weight During Travel: $\dfrac{(\text{Unloaded} + \text{Loaded})}{2} = \dfrac{13 + 15}{2} = 15\,\text{tons}$

Calculate Emission Factors

$$E = k\left(\frac{0.799}{2}\right)^{0.65} * \left(\frac{12.73}{3}\right)^{1.5}$$

E = 4.818*k

PM: 4.818 * 24 = 115.6 grams PM/vehicle kilometer traveled or 0.410 lbs PM/VMT

PM_{10}: 4.818 * 4.6 = 22.16 grams PM_{10}/vehicle kilometer traveled or 0.079 lbs PM_{10}/VMT

Maximum Hourly Emission Rates

PM: $\dfrac{2\,\text{VMT}}{\text{hr}} * \dfrac{0.410\,\text{lbs PM}}{\text{VMT}} = 0.820\,\text{lbs PM/hr}$

PM_{10}: $\dfrac{2\,\text{VMT}}{\text{hr}} * \dfrac{0.079\,\text{lbs PM}}{\text{VMT}} = 0.158\,\text{lbs PM}_{10}/\text{hr}$

Summary of Estimated Emissions of Particulate Matter

Maximum Annual (tons/year):   PM   3.97
                                      PM_{10} 0.73

Calculation of Emission Rates of Hazardous Air Pollutants

$$E_i = \frac{W_i}{100} * PM$$

where: E_i = Emission rate of pollutant "i"

                   W_i = Weight percent of pollutant "i" as a constituent in the blended product

                   PM = Emission rate of total particulate matter

Summary of HAPs Annual Emissions

Hazardous Air Pollutant	Weight Percent in Pre-Blend Product	PM Released to Atmosphere
Arsenic Compounds	0.01	1.10 E-04
Cadmium Compounds	0.01	1.10 E-04
Chromium Compounds	0.03	3.30 E-04
Lead Compounds	0.01	1.10 E-04
Manganese Compounds	0.22	2.42 E-03
Nickle Compounds	0.01	1.10 E-04
Total HAPs	**0.29**	**3.19 E-03**